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ABSTRACT

Thirty eleventh-grade students were the subjects of a study to determine whether a person reporting a high degree of mental imagery in reading would also score well on comprehension tests and report a positive attitude toward reading. Subjects were first given the Estes Reading Attitude Scale, the results of which indicated no significant differences between the subjects' attitudes toward reading and those of their nonsubject classmates. Three days later, the subjects read two prose passages, one of a high image-evoking nature, the other low image-evoking. Comprehension was assessed by means of a short answer test with literal-recall and inferential questions, and by a modified cloze test. A visual-recall task was also given, following a brief questionnaire in which the subjects stated whether or not they had experienced mental imaging during the prose comprehension task, how much, which passages were easier and whether or not they liked to read. The results of the comprehension tests and the questionnaire indicated that in every case high imagery students performed at the highest level, moderate imagery students at a middle level, and low imagery students at the lowest level on both of the prose comprehension tasks and on the visual-recall task. Surprisingly, the moderate imagery subjects had the lowest mean score on the attitude test. The results supported the idea that mental imagery is related to comprehension as well as to attitude. (HTH)

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Reading Comprehension and Attitude of High and Low Imagers: A Comparison

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Two continuing problems that have been the subject of considerable research are the development of reading comprehension ability and the cultivation of positive attitude toward reading. In recent years, a number of studies have found a positive relationship between reading comprehension and mental imagery (Anderson, 1972; Dillingofski, 1981; Koskinen & Gambrell, 1980; Lesgold, Curtis, DeGood, Golinkoff, McCormick & Shimron, 1974; Levin, 1973). Much less work has been reported in the area of mental imagery and reading attitude (Cramer, 1980; Irwin, 1979). What is of interest is that researchers in both areas of reading comprehension and reading attitude have been working with the concept of mental imagery. This study attempted to address both reading comprehension and reading attitude in their possible relationships with mental imagery.

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The concept of mental imagery is a very old idea which is currently undergoing a revival of interest. Mental imagery has been defined by Litt (1973) as revived sensory experience in the absence of the original sensory stimulation. Any study that undertakes to investigate the concept of mental imagery must deal with an important obstacle: the reliability of instrospective reports of imaging. The work of Marshall (1968) and the earlier work of Golla, Hutton, and Walter (1943) in the measurement of alpha rhythms through electro-encephalographic recording during periods of self-reported imaging has done much to establish the validity of the mental imagery concept.

The purpose of this study was to investigate relationships among the three major concepts, reading comprehension, attitude toward reading, and mental imagery. The principal research question asked in this study was, "If a reader self-reports a high degree of mental imaging, will that reader also score well on comprehension tests of prose passages and report a high attitude toward reading?" In short, if it is so that mental imagery is related to both reading comprehension and reading attitude, then many questions of major importance to the teaching of reading could be addressed. For example, is the ability to form mental images susceptible to instruction during reading? If so, what are effective and efficient methods of developing mental imaging during reading? What are the effects of mental imaging on long-term retention of material learned through reading? What are long-term effects of imaging ability on positive attitudes toward reading? Are there optimum ages for developing reading comprehension skills or for nurturing positive attitudes through the use of mental imagery? All of these and many other related questions would, however, be pointless without a demonstrable correlation among the three major concepts of reading comprehension, reading attitude, and mental imagery.

Method

Subjects

The subjects of the study were 30 eleventh-grade students, selected randomly from language arts classes in two high schools (one urban, one suburban) in the Chicago area. In each school, the 15 subjects were characterized by local administrators and reading specialists as at or slightly below average achievement levels. No other demographic data were collected for the subjects since it was believed that effects of such variables as sex, race, IQ, and age would be controlled through the randomization process, and since it was also believed that the concepts of mental imagery, reading comprehension, and reading attitude ought to be powerful enough to emerge from the others. It would be fair to say that among the 30 subjects were representatives of several ethnic groups and an almost equal balance of males and females.

Materials

Estes Reading Attitude Scale. Developed by Estes (1971), this attitude measure was validated in a study by Dulin and Chester (1974). The Estes Reading Attitude Scale was administered to all subjects by their normal classroom teachers exactly three days before the other measures were given to the subjects. This procedure was followed so that (a) subjects' attitudes could be compared with those of their regular classmates and (b) subjects' attitudes would not be influenced by other measures used in this study. When the mean score of subjects' attitudes were compared with the mean of their classmates, there was no significant difference, with the inference that subjects' attitudes did not differ from those of non-subjects in this study.

Prose comprehension tasks. Two prose passages of approximately 300 words were selected for the study. The first passage, which was about a tiger hunt, was estimated to be of a high image-evoking nature; the second passage, which was a discussion of the theory of hypnosis, was estimated to be of low image-evoking quality. The designations of high image-evoking or low image-evoking quality was verified through an inter-judge reliability procedure conducted with graduate students in education who were in unanimous agreement with the original designations. Both passages were also judged to be within the readability limits of average ninth grade students.

Comprehension was assessed in two ways. First, a five-item short answer test was constructed for each of the passages. In each short answer test, three of the items were of literal-recall and two were inferential. Short answer tests were chosen over other traditional comprehension measures such as multiple choice and true-false in order to eliminate or at least control the "guessing" factor.

In addition, for each of the two passages, low and high image-evoking, a modified cloze test was constructed from the second paragraph of the passage. Scoring was on the basis of exact replacement of missing words in an every-fifth-word deletion pattern for a total of twenty blanks in each passage.

Visual-recall task. In the visual-recall tasks, unlike the prose comprehension tasks, subjects were specifically instructed to form mental images about what they were reading in order to perform a simple diagramming task without referring to the passage. Three visual-recall tasks were adapted from workbook-type exercises. Task one involved three items which were part of directions from a filling station to a restaurant. Task two involved seven items involving details of geography of an island. Task three involved ten items dealing with the physical arrangement of objects in a country garden.

Thus, there were twenty items over the three visual-recall tasks for subjects to draw in simple diagrams. Each item remembered and placed correctly in the diagram was scored as one point.

Questionnaire on reading activities. Subjects completed a brief questionnaire immediately upon completion of the prose comprehension tasks and prior to attempting the visual-recall tasks. In the questionnaire, subjects stated whether or not they had experienced mental imaging during the prose comprehension tasks, how much of the time imaging occurred, if indeed it had, which passage seemed easier, which passage they had enjoyed more, and whether or not they like to read.

Procedure

Three days after subjects had been administered the Estes Reading Attitude Scale as a part of their normal classroom activities, they were given the prose comprehension tasks, the questionnaire on reading activities, and the visual-recall tasks. On the basis of subjects' responses to the imaging questionnaire, three groups of data were derived: high imagers were those subjects who reported using imagery 75-100% of the time they were reading the prose comprehension passages; moderate imagers, 50%; and low imagers 0-25%.

Results

Mean scores and standard deviations were calculated for the three imagery groups (high, moderate, and low imagers) on the attitude measure and the comprehension and visual recall tasks. Results, as shown in Table 1, indicate that in every case high imagers performed at the highest level, moderate imagers at a middle level, and low imagers at the lowest level on both of the prose comprehension tasks and on the visual-recall tasks. Although only one comparison of mean scores reached statistical significance (short

answer task for low image-evoking passage), a clear trend is apparent, stepwise in the anticipated direction.

Perhaps the most interesting finding in this study was in the area of reading attitude. A simple ANOVA was calculated for the three imagery groups on the attitude variable with the resultant $F(2,27) = 3.56$, $p < .041$. However, of special interest was the lowest attitude mean score of the moderate imagery group. Further, the standard deviation of the attitude score of the moderate imagery group was about twice a great as that of either of the other two groups.

Thus, it may be said that, in general, the results of this study support the idea that mental imagery is related not only with reading comprehension but also with reading attitude. Mean scores of high, moderate, and low imagery subjects on comprehension tasks involving both high and low image-evoking prose passages were not significantly different, but the did show a stepwise trend in the anticipated direction overall. Further, high imagers outperformed the moderate and low imagers on visual recall tasks, also in a stepwise progression. However, the fact that the moderate imagers had the lowest mean score on reading attitude is a rather surprising finding which obviously requires further and more careful study.

Additional directions for further research should include the possibility of enhancing reading attitudes of students through the use of mental imagery.

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Table 1

Means and Standard Deviations on an Attitude Scale and Five Comprehension Tasks by High, Middle, and Low Imagery Groups

		High Imagers* (75-100%)	Mid Imagers* (50%)	Low Imagers* (0-25%)
Attitude Scale	M	75.7	59.7	68.4
	SD	8.6	8.3	18.4
High Image-Evoking Passage (Short Answer Task)	M	3.1	2.8	2.0
	SD	1.1	1.8	1.7
High Image-Evoking Passage (Cloze Task)	M	9.2	7.3	6.1
	SD	1.3	4.1	3.6
Low Image-Evoking Passage (Short Answer Task)	M	3.2	2.2	1.5
	SD	1.6	1.5	1.3
Low Image-Evoking Passage (Cloze Task)	M	9.0	7.8	6.4
	SD	2.1	4.8	4.2
Visual-Recall Task	M	13.2	11.2	10.3
	SD	4.1	7.1	6.0

* High Imagers (n = 9)
  Mid Imagers (n = 10)
  Low Imagers (n = 11)